

GUFFEY

PATENT ATTORNEY

Web Site: www.GuffeyLaw.com
EMAIL: larry@GuffeyLaw.com
PHONE: 410/659-9550
FAX: 410/659-9549

WORLD TRADE CENTER
SUITE 1800
401 EAST PRATT STREET
BALTIMORE, MARYLAND 21202

SUBURBAN OFFICE:
100 WEST ROAD - SUITE 300
TOWSON, MARYLAND 21204

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To: Ex. D. Van Nguyen, USPTO, Group 3723

Fax Phone: 1-703-746-3275

From: Larry J. Guffey

Subject: Pat. Appln. No. 10/010,663

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Application No. 10/010,663
For: "Porous, Lubricated Mixing Tube For Abrasive, Fluid Jet"

Filed: 12/6/01

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To: Examiner Dung Van Nguyen
USPTO, Group 3723 (Plaza II, 11B24)

RE: Some of Proposed Arguments To-Be-Made At 8/19 Interview With Examiner
Application No. 10/010,663
Att. Dkt. No. : JHUKA1
For: "Porous, Lubricated Mixing Tube For Abrasive, Fluid Jet"

Dear Examiner Nruyen:

As we agreed that I would do during our brief conversation on 8/7/03, listed below is a partial preview of some of the proposed arguments that I hope to make at my upcoming interview with you regarding the prosecution of the above referenced patent application:

1. It is erroneous to hold that Claims 1-3, 5-12, 14-16, 19-25, 27-29, 32-38, 40-42 and 45-51 are anticipated by Katz (USPN 5,921,846) because of:

A. Structural Differences Between the Present Invention and That Disclosed in '846:

(a) the "slurry mixing chamber 2" of '846 is not equivalent to the chamber (10) of the present invention since the "slurry mixing chamber 2" has only one inlet where a high pressure slurry (of a carrier fluid, such as water, and abrasive particles at a concentration of 1-5% by volume) enters the chamber 2 and then exits through a nozzle 7. Meanwhile, the chamber (10) of the present invention has two entry ports (12 and 14), both of which are claimed and one exit (16) (See attached Claim 1 to which has been added enumerated reference signs). A pressurized fluid jet enters through the inlet (12) and entrains (essentially dry) abrasive particles to enter the chamber (10) through the entrainment port (14). The resultant fluid jet with its entrained abrasives exits the chamber at its exit (16), and

(ii) the "nozzle or orifice 7" in '846 is not equivalent to the focusing or mixing tube (20) of the present invention, which is specifically claimed ("a mixing tube (20) having an entry port (18) for receiving said fluid jet and entrained abrasives [NOT a slurry as enters the nozzle 7 of '846], an inner wall (22) for directing the flow of said fluid jet and entrained abrasives, and an outlet port (24) through which said fluid jet and entrained abrasives exit said tube (20), wherein said tube entry port (18) is proximate said chamber exit (16) [AS OPPOSED TO being the

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chamber's actual exit orifice as in the "nozzle or orifice 7" of '846],"so as to emphasize the differences between these elements.

Applicant respectfully asks the Examiner to admit that he cannot find the underlined portions of this cited claim language in '846. Similarly, in the claiming of the chamber (10) (i.e., "a chamber (10) having an inlet (12) for receiving a pressurized fluid jet, a port (14) for receiving a flow of abrasive particles which are entrained into said fluid jet, and an exit (16) through which said fluid jet and entrained abrasives exit said chamber,") the applicant asserts that the Examiner cannot find the underlined claim language associated with the "slurry mixing chamber 2" of '846.

Applicant respectfully asks the Examiner to admit that the applicant has now successfully pointed out how the language of the claims patentably distinguishes them from '846.

B. Examiner's Inability To Comprehend The Relevant State-of-the-Art Technology At Issue In This Application And The Industry Recognized Differences Between the AWJ of the Present Invention And the AWSJ of '846

Applicant's recent R132 Declaration does far more than the Examiner apparently recognizes: "The declaration only provides the references that are related to the invention. The references amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references," p. 5, para. 9 of Examiner's Final Office Action.

The Examiner appears to continue to misunderstand what those in the water jet cutting industry know to be the differences between the elements of the abrasive water jet (AWJ) cutting head of the present invention and the elements of the abrasive water suspension jet (AWSJ) cutting head of '846:

Structural Differences: -- summarized above.

Operational Differences:

The structural differences between a AWJ and a AWSJ have a significant operational impact on these two cutting heads: (a) recycling of abrasive particles is easier with the AWSJ of '846 than with the AWJ of the present invention because with an AWSJ one is always dealing with a single input that consists of a slurry of abrasive particles and thus there is no need to totally dry the reclaimed abrasive particles as is required for the AWJ of the present invention which must entrain such particles thru the entrainment port (14), (b) the AWJs of the present invention generally have to operate at higher pressures than the AWSJs of '846 in order to be able to entrain sufficient quantities of abrasive particles so as to attain desired cutting powers; consequently, AWJs generally require more power consumption than AWSJs for the same cutting ability.

This situation of the Examiner not fully comprehending the state-of-the-art in the relevant technology exists in spite of the fact that the applicant in his R132 Declaration specifically addressed this issue for the Examiner: "I am including as part of this Declaration pages 5-16 of

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my doctoral dissertation. Pages 9-16 of this submission are especially pertinent because they explain the differences between an AWJ and an AWSJ," p. 2, para. 5 of R312 Declaration.

For brevity sake, I will stop here. I hope that the above will be helpful to you and will lead to your reconsideration of the opinions expressed in your current Final Office Action.

Allowance of Claims 1-2, 14-25, 27-38, and 40-51 of the present application is respectfully requested, as it is anticipated that I will cancel the objected to Claims 13, 26, 39 and 52 from the application.

Respectfully submitted,

Larry J. Guffey
Registration No. 37,048
World Trade Center - Suite 1800, 401 East Pratt Street, Baltimore, MD 21202
(410) 659-9550
ATTORNEY FOR APPLICANT

Date

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CLAIM 1 WITH REFERENCE SIGNS

1. An abrasive, fluid jet cutting apparatus (1) comprising:

a chamber (10) having an inlet (12) for receiving a pressurized fluid jet, a ^{separate} port (14) for receiving a flow of abrasive particles which are entrained into said fluid jet, and an exit (16) through which said fluid jet and entrained abrasives exit said chamber (10),

a mixing tube (20) having an entry (18) port for receiving said fluid jet and entrained abrasives, an inner wall (22) for directing the flow of said fluid jet and entrained abrasives, and an outlet (24) port through which said fluid jet and entrained abrasives exit said tube (20), wherein said tube entry (18) port is proximate said chamber exit (16),

a lubricating fluid reservoir (28) that surrounds at least a portion of the outer wall (26) of said mixing tube (20),

wherein at least a portion of said mixing tube wall being porous, and

wherein said lubricating fluid passes from said lubricating reservoir (28) and through said porous wall to lubricate at least a portion of the surface of said mixing tube wall so as to resist erosion of said tube wall while the fluid jet and entrained abrasives flow through said mixing tube (20).